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November 6, 1954

VOL. 66, NO. 19 PAGES 289-304

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Polyethylene

See Page 302

A SCIENCE SERVICE PUBLICATION

Bell's new Telephone Answering Set. In use, the machine tells the caller when to start talking, and when his time—thirty seconds—is up.

He's out . . . but he's answering his telephone!

This newly designed Bell Telephone Answering Set makes it possible for you to go out—but leave your voice behind.

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The new machine features "talking rubber," a Laboratories-developed recording medium of rubber-like plastic and iron oxide which can be used over and over again millions of times. It is another example of how Bell Laboratories research works to help your local Bell Telephone Company serve you in new ways.

Bell Telephone Laboratories

Improving telephone service for America provides careers for men in scientific and technical fields

MEDICINE

Hormones and Antibiotics

Combining antibiotics and hormones found effective for combating disease germs. Mold drugs are now entering the war against cancer.

► THE NEW way to treat serious infections is to use both an antibiotic, such as penicillin, and one of the hormones famous as anti-arthritis drugs, cortisone, hydrocortisone or corticotropin (ACTH).

Success with this double-barreled attack on disease germs was reported by half a dozen doctors from different parts of the country at the Second Annual Symposium on Antibiotics held in Washington under the sponsorship of the U. S. Food and Drug Administration and the journal, *Antibiotics and Chemotherapy*.

Heretofore, doctors have considered it dangerous to give the hormones to patients with infection. This was because laboratory animals with infections usually died if given these hormones.

The hormones, however, have two effects which should be helpful in fighting infections: 1. a profound anti-inflammation effect; and 2. a non-specific antitoxic effect that acts to counteract poisons from disease germs.

The advantages of the hormones can be realized if they are given with a suitable antibiotic and if certain other precautions are observed, Dr. Laurance W. Kinsell of the Highland Alameda County Hospital, Oakland, Calif., reported.

Experience during the past four years, he said, shows that giving the corticoid hormones results in "rapid and striking clinical improvement" with lessened toxicity of the system. If antibiotics are given at the same time deaths and sickness can be lessened without any untoward effect of the corticoid.

A high-calorie, high-protein, high-potassium and low-sodium diet must be given at the same time. Corticotropin must be given at least one day longer than cortisone, to prevent any residual damage to the adrenal glands. And the antibiotics must be given for at least three days after all hormones have been stopped to protect against any spread of the infection that might result from residual effects of the hormones.

Dr. Kinsell's hospital now uses this treatment as a routine for all patients with nontuberculous meningitis; for very weak patients with generalized peritonitis or any patient with peritonitis of more than 24 hours duration, and for any patients with an infection where it seems probable death will occur before the antibiotics have time to do their work.

"Dramatic" improvement following this treatment in five patients severely sick with infectious mononucleosis was reported by Drs. Edward L. Quinn, David Bunch and Muriel Carson of the Henry Ford Hospital, Detroit.

Prompt relief of symptoms with improvement or cure in 22 of 24 external eye infections followed this treatment, Capt. Robert W. Neidlinger of Brooke Army Hospital, Fort Sam Houston, Tex., reported.

Ointments and lotions containing both antibiotics and hydrocortisone have proved valuable in treating certain skin conditions, particularly where pus is a complication of the eruption, Dr. Harry M. Robinson Jr. of Baltimore said.

Mold Drugs for Cancer

► ANTIBIOTICS ARE entering the war against cancer. These chemicals belong to the group of mold remedies, so called because the first one, penicillin, comes from a mold. Heretofore they have been famous for the number of germ diseases and infections which they can stop.

The new phase of the antibiotic era was discussed at the same symposium.

Puromycin, one of the newer antibiotics, slows the growth of one kind of breast cancer transplanted into mice, a team of scientists from Lederle Laboratories, American Cyanamid Company, Pearl River, N. Y., reported.

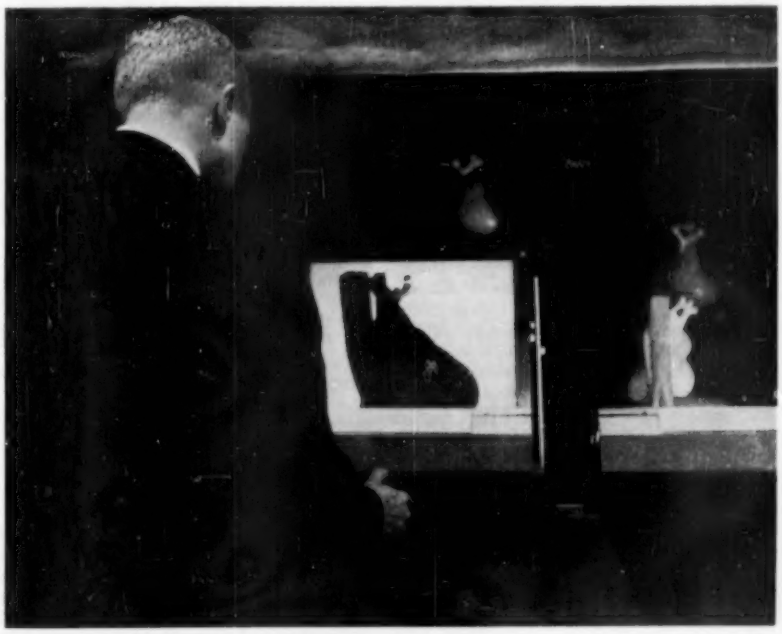
One part of the molecule, the aminonucleoside portion, has the cancer-arresting activity, Drs. P. L. Bennett, S. L. Halliday, J. J. Oleson and J. H. Williams of Lederle have found.

Following this lead, they have tested a number of similar amino acid compounds and have found five that have equal or better anti-cancer activity in laboratory animals.

Puromycin comes from one of the *Streptomyces* soil organisms of the same general family that earlier yielded streptomycin.

Trial in human cancer patients of another antibiotic was also reported to the meeting. This is a new antibiotic, actinomycin C. Its anti-cancer activity in mice and results of trial in 15 human patients were described by Drs. John B. Field and Miss Francoise Costa and Miss Angela Boryzka of Schenley Laboratories Inc., New York.

Other new antibiotics reported include: fungichromin and fungichromatin from Sharpe and Dohme, division of Merck and Co., Inc., West Point, Pa.; spiramycine from the Rhone-Poulenc Laboratories, Paris, France; etamycin from Bristol Laboratories, Inc., Syracuse, N. Y.; griseoviridin and viridogrisein from Parke, Davis and Company, Detroit; pleomycin from Sharpe and Dohme; anisomycin and PA-105 from Chas. Pfizer and Co., Inc., Brooklyn, N. Y., and



HEART SILHOUETTES—The silhouettes of hearts can aid doctors in the diagnosis of heart defects, as Dr. J. Scott Butterworth demonstrates here. The outlines on the screen give clues to troubles. The screen can then be folded so the heart model can be studied, thus allowing a check of the diagnosis by silhouette against the easier-to-see faults of the model.

celesticetin from the Upjohn Company, Kalamazoo, Mich.

Amebic infection, known to the layman as amebic dysentery, and the widespread infection of the female genital tract, trichomoniasis, are being effectively attacked by some of these antibiotics.

Antibiotic Clears Acne

► SMALL DAILY doses of an antibiotic called Tetracyn, or tetracycline, brought good results in patients with acne that had not been helped by other treatments such as sulfur-resorcin lotion, carbon dioxide slush, X-rays and hormones.

Of 75 patients, one-third got "excellent improvement," another third got "good" improvement and one-third only fair improvement, Drs. William C. King and M. Allen Forbes Jr. of the University of Texas Medical Branch, Galveston, reported at the Second Annual Symposium on Antibiotics.

The patients have been observed from one to three months and most are still under observation.

Why such small doses of the antibiotic give such good results is not known. Bacteriological studies now under way will, the scientists hope, give the answer to this question.

Parrot Fever Epidemics

► THE DANGER of humans getting parrot fever, or psittacosis, from parakeets and other birds can now be eliminated, it appears from a report made at the symposium.

The report came from one of the foremost authorities on parrot fever, Dr. K. F. Meyer and his associate, B. Eddie, of the George Williams Hooper Foundation, University of California, San Francisco.

The way to stop this disease threat to humans, Dr. Meyer and associate found, is to have breeders treat their birds with either chlortetracycline or tetracycline. These two antibiotic drugs are better known as Aureomycin and Achromycin. Aureomycin is regularly used to cure humans who contract the disease from birds.

The California investigators gave twice daily injections of Aureomycin or Achromycin to 181 parakeets for 14 days from flocks known to be infected with latent psittacosis. All of the birds who were sacrificed proved free from psittacosis, and no evidence of infection was found in their offspring.

A related disease known technically as ornithosis can similarly be stopped from spreading to humans by treating squabs in breeding establishments, the California scientists found.

Squabs in various stages of natural acute and latent ornithosis, which proved fatal to 50% of untreated birds held under observation as controls, were freed from the infection when injected three times a day for 25 days.

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Whole *milk* can be stored in the home freezer for as long as six weeks without losing its flavor.

TECHNOLOGY

Tin Cans Tailor-Made

Although all tin cans look pretty much alike, they actually are designed especially for the product they will contain, involving many fields of research.

► TO THE casual observer one tin can looks like any one of the other 35,600,000,000 used in the U. S. each year, but actually this ubiquitous container is by no means a simple product to develop and manufacture.

Virtually every type of metal can is tailor-made for the item it is destined to package. Its development involves research into metallurgy, chemistry, engineering and a host of other technical aspects. One of the most recent examples, a container which was years in development, is American Can Company's flat top can for soft drinks.

This can, too, looks almost identical to many other tin cans, but it required the efforts of many engineers, scientists and laboratory researchers to perfect.

First, there was research with suppliers of tin plate to obtain the correct chemical and physical properties of the steel, proper gauge and tensile strength, and the optimum amount of tin.

Then, new interior can coatings were developed to protect the quality and flavor of the soft drinks. Even the profiles of the can ends, where five folds of metal make an airtight seal, were redesigned for added strength against internal pressures.

An interesting part of the soft drink can's architecture is the "nine-tab" construction along the side seam where the body of the can is joined together with outside solder. These tabs overlap on the edges of the seam and make the can so strong that under test the solid part of the can's metal body will stretch before the seam itself breaks. Yet these tabs are barely visible to the eye.

The can company also had to make sure that the high-precision manufacture of this can—some parts fabricated to tolerances of one-thousandth of an inch—would be capable of economical mass production at speeds of 450 cans per minute on a single production line.

Quality control checks are made constantly along the entire manufacturing line. One of the factory tests is a "blow-up" method performed by a large device that measures the side seam strength of the can under various internal pressures well above those that would ever be attained commercially.

Another highly sensitive instrument, capable of weighing small pieces of tin plate at weights as low as one-thousandth of a milligram, helps maintain accurate coating control. Still another chemical test is made to determine the degree of manufacturing quality of can interiors and even the most minute scratch can be detected.

Although it is called a "tin" can, the average food can is made up of less than two percent tin and more than 98% steel. This unique container not only continues as the backbone of the packaging field, but also has revolutionized the marketing of such products as beer, coffee, paint and motor oil.

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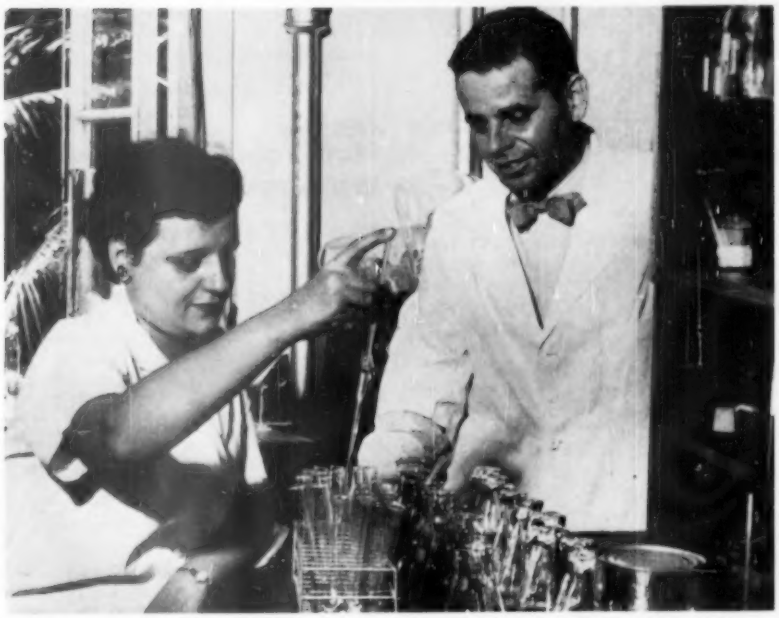

VITAMIN C SOURCE—Dr. Conrado F. Asenjo, discoverer of the extraordinary vitamin C content of the acerola, aided by nutritionist Maria Martinez, at work in his laboratory.

NUTRITION

New Vitamin C Juice

➤ A CHERRY a day keeps scurvy away, but it takes a particular kind of cherry to do it. It is a West Indian cherry known as acerola and only distantly related to the cherry family.

The acerola is said to be the richest edible fruit source of anti-scurvy vitamin C. But since it is a very perishable fruit, few of us could get our vitamin C from the cherry-a-day practice. We will be able to get it soon, however, in canned fruit juice.

Discovery of the very high content of the acerola was announced by Dr. Conrado F. Asenjo and Dr. Ana Rosa Freire de Guzman of the School of Tropical Medicine, San Juan, Puerto Rico, in 1946. (See SNL, March 9, 1946, p. 152.)

Now Harvey Greenspan, chairman of the board of the BiB Corporation, has announced in New York that his company has begun processing acerola juice and will soon market it blended with apple, pear, pineapple, tomato and other juices as a natural protective food for infants and children.

Small amounts of acerola juice added to fruit juices poor in vitamin C can produce blends with a vitamin C content well above the average orange juice, Dr. Asenjo states.

Although the small, bushy acerola tree has apparently grown wild in Puerto Rico for over 2,000 years, it is such a poor germinator that it took almost eight years of experimental work before scheduled crops could be guaranteed on a large enough scale to enable BiB Corporation to start processing it for the market.

Dr. Arturo Roque and agronomist Enrique Molinary of the University of Puerto Rico's Agricultural Experiment Station did the experimental work leading to development of acerola as a cash crop tree.

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GENERAL SCIENCE

Interlingua Used at Adrenal Conference

➤ INTERLINGUA, THE new language for scientific communication, was used at the Symposium on Adrenal Function in Infants and Children held at the Upstate Medical Center of the State University of New York, Syracuse, N. Y., Nov. 3 and 4.

Abstracts of the papers presented were available in Interlingua to promote rapid diffusion of this specialized knowledge throughout the world. Copies of the volume of Interlingua abstracts will be deposited in medical libraries over the world to make available to medical scholars everywhere new advances described in a supranational language.

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BIOCHEMISTRY

Hint Chemical in Blood Plasma Makes Burns Hurt

➤ A CHEMICAL that could be the stuff that makes burns and blisters hurt has been discovered in blood plasma.

The chemical was discovered by Drs. Desiree Armstrong, C. A. Keele, J. B. Jepson and J. W. Stewart of Middlesex Hospital Medical School, London.

They call the chemical "pain-producing substance." They have not yet been able to isolate it in pure form nor to determine its chemical make-up, but it probably is a polypeptide.

When blood plasma escapes from the tiny blood vessels called capillaries, the pain-producing substances might develop and cause pain when it makes contact with damaged tissues, as in burns, the scientists suggest in *Nature* (Oct. 23).

They are at present studying its role in the production of pain due to burns and other disease conditions.

When applied to the exposed base of a blister, the chemical produces pain but does not cause itching, flare or wheal. In addition to this action, it causes contraction of the rat uterus when removed from the animal's body.

The chemical does not develop in plasma if contact with glass and metal is avoided in the collection of the blood and separation of the plasma. However, it does develop within a few minutes after the plasma is transferred to a glass tube. Its activity reaches a peak within ten minutes and decays to one-tenh or one-twentieth of peak value in an hour.

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GENERAL SCIENCE

People Above Average Are Valuable Resource

➤ THE SMALL number of people who are far above average are most important in defending freedom against ruthless totalitarianism, Dr. Joel H. Hildebrand, University of California chemist and president-elect of the American Chemical Society, stated in Birmingham, Ala.

The talents of our gifted citizens constitute a distinctly limited resource, he warned.

One of the most common mistakes is to deal with human beings in terms of averages, Dr. Hildebrand stated. We make matters worse, he said, by designating the average as "normal," as presenting a norm to which all individuals should try or, worse still, be made to conform.

Many people evidently regard anyone with outstanding intellectual achievement to his credit as abnormal, and therefore suspect, he said. They resent the thought that anyone else can be superior to themselves. Society sometimes behaves, Dr. Hildebrand suggested, like a farmer who would slaughter any cow that gave substantially more milk than the average.

Science News Letter, November 6, 1954

ASTRONOMY

Astronomical Highlights

Interesting contributions during the past year include ones concerning positions of stars as well as in the new field of radio astronomy.

► TEN TOP astronomical highlights of the past year, picked by Dr. Harlow Shapley of Harvard University.

1. Out of the abundance of amazing contributions in the field of radio astronomy—contributions from Holland, England, Australia, the United States and Canada—especially noteworthy was the work of John D. Kraus and H. C. Ko of the College of Engineering of Ohio State University. They mapped much of the northern sky as it would be seen to an eye sensitive only to radiation of wavelength about four feet. The Milky Way is clearly recorded in this radiation, as well as the Virgo group of galaxies, the intensely bright galactic nucleus, and some special hot spots in Centaurus, Cygnus, and especially Cassiopeia. To this radio eye globular star clusters remain undiscovered.

2. The dedication of the new Pulkovo Observatory, near Leningrad in Russia, built on the site of war ruins, brought again into the national and international picture a large institution that one hundred years ago was sometimes rated as the astronomical capital of the world.

3. Two large enterprises in the astronomy of position were completed. At the Lick Observatory, Director C. D. Shane, assisted by C. A. Wirtanen, completed the first series of plates for the sky mapping program, planned many years ago by the former director, W. H. Wright; and at the University of Minnesota Dr. W. J. Luyten finished the Bruce Proper Motion Survey, adding 19,000 stars to his lists of those with appreciable motion—an investigation that has continued steadily for 25 years. Some decades from now the Lick Observatory series of plates will be repeated and will then provide the best material ever assembled for the study of star motions referred to distant galaxies.

Evaluation of the rotation of our galaxy is one of the goals of this long-range investigation.

4. At the Mexican National Astrophysical Observatory, Tonanzintla, Puebla, Dr. Guillermo Haro, director of the Tonanzintla and Tacubaya Observatories, discovered and measured a large number of "slow motion" flare-like stars in the nebulosities of Orion.

5. Dr. Milton Humason of Mt. Wilson-Palomar completed at least one phase of his elaborate study of the radial velocities of 580 galaxies, which, when supplemented by Dr. N. U. Mayall's measures at the Lick Observatory of the red shifts of nearly 300 galaxies, will provide the basic information on the expanding universe. Dr. Humason finds 20 galaxies with velocities in excess of 25,000 kilometers per second, with the greatest speeds just over 60,000 kilometers per second.

6. New and highly promising developments were reported in the utilization of solar energy, including (a) the large scale production of solar cookers in India, (b) a practical solar cooker developed in California, which can attain a temperature under best conditions of 8,500 degrees Fahrenheit (not much less than the temperature of the solar surface), and (c) some partially revealed developments in the Bell Telephone Laboratories and the Wright Air Development Center, which involve cells and batteries that absorb the solar radiation and make it efficiently available for heating.

7. The production of a color-magnitude array for the globular cluster Messier 3, reaching down for the first time to stars of less candle power than that of the sun, was accomplished by H. C. Arp and A. R. Sandage with the Hale telescope on Mt. Palomar.

8. A new and appealing proposal was advanced by Dr. Dean B. McLaughlin of Michigan University to account for the markings on Mars. They can be reasonably explained as analogous to the dust bowls of the Southwest. The "trade winds" on Mars (where the absence of oceans and of long mountain ranges permits them to behave otherwise than with us) pile up, in drifts and ridges, the sand, dust and volcanic ash, some of which, because of the lack of oxygen in the Martian atmosphere, can have a greenish tone. Thus both the canals and the life on Mars are disposed of as largely illusions produced by Martian meteorology. To provide the drift material, active volcanoes are required. Only an astronomer competent in geology and meteorology could have originated the theory.

Although only preliminary results have been reported, the wide attack on the total solar eclipse of June was noteworthy, and especially the ten-station program of the U. S. Air Force, which distributed observers all the way from Ontario through Labrador, Greenland, Scandinavia, to Iran.

10. An extensive and very valuable program of support for astronomical research was followed by the National Science Foundation, and considerable assistance was given to pure astronomical investigations by the U. S. Air Force, the U. S. Navy and the National Bureau of Standards.

In summary, the past year has been noteworthy for interesting contributions all the way from the heart of the old astronomy (positions of stars) to the astronomical borders where the scientists of other fields, such as radio and engineering, contribute importantly to our knowledge of stars, galaxies, interstellar dust, and the solar system.

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NUTRITION

More Food Needed for Increased Population

► VAST INCREASES in food needs are foreseen by the Food and Agriculture Organization of the United Nations as a result of expected population increases.

The FAO report admits the hopelessness of reaching "fully satisfactory nutritional standards" because the "attainment of such standards is clearly impossible in the near future over large areas of the world."

A somewhat lower and more nearly realizable dietary level has been set as a target, but even to reach this would require large increases in food supplies.

In the world as a whole, during the next 25 years, supplies of cereals—the most important of staple foods—need to be increased by 43%, according to FAO estimates, merely to feed the extra mouths at recent nutrition levels, whereas to achieve modest improvement would require an additional 10%. To reach the improved levels, fish supplies would have to be augmented 88% and milk, some 70%.

Disparities in local production are still more marked, with the required increase of cereals in the Near East to reach the improved level being some 78% and for milk, 81%.

The report does not forecast whether or not the target levels will be reached but states that "though there may be no technological reasons why food production cannot be raised by the indicated order of magnitude," this would "call for a much greater effort than is envisaged at present."

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PALEONTOLOGY

Mexican Fossil Find Adds New Time Evidence

► THE MEXICAN mammalian family tree has added more than 10,000,000 years to its ancestry with the report of the uncovering of the first remains from the Miocene period to be found in Mexico or Central America.

Fossilized remains of the palate and limb bones of a Miocene horse, Merychippus and the distal of a small cannonbone from what is thought to be a lower Miocene camel, Oxydactylus, were unearthed.

The discovery was made in the Valley of Nejapa along the Pan American Highway, about 750 miles south of Mexico City.

It represented the first evidence that mammals of this period in geological history 29,000,000 years ago had inhabited the land area between Panama and the United States-Mexico border.

The discovery, made in 1952, is reported in *American Journal of Science* (Oct.).

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PILOT'S ANXIETY CHECKED—When jet pilots get anxious, as they sometimes do, they are likely to breathe harder than usual. That can make them dizzy and bring on an accident. The Air Force School of Aviation Medicine at Randolph Field, Texas, is studying "hyperventilation," as it is called. Here Dr. Robert T. Clark Jr. (left) shows Capt. Truman Parker of Flying Training Air Force headquarters how an instructor can measure the breathing of a student pilot (right) with a compact device developed at the school.

GEOGRAPHY

Top of World Rotates

Find evidence indicating that the Arctic ice mass is rotating clockwise, making a full circle in five or ten years. The pack is thinner than once thought.

► ENEMY GROUND forces, fighting on the Arctic ice pack, could find that their battleground has rotated in such a manner that they were facing in opposite directions.

There is evidence to indicate that the huge ice mass sitting on top of the world rotates in a clockwise direction, making a full circle in five or ten years.

A well-known Arctic authority told SCIENCE SERVICE that if a weather station were established on the ice pack on the North American side, it is conceivable that in five years time, it would end up on the Siberian side.

The Arctic ice pack is made up of thin ribs of pressure ice which at time are very loose, while at other times they become a thick mass of crushed ice.

Recent investigations have shown that the Arctic ice pack is much thinner than previously thought. Original estimates were that the pack was upwards of 200 feet thick. It is now known that the ice mass is generally only four to six feet thick. There are places where it has been found to be from six to 15 feet thick.

Just who owns the ice pack is one of the peacetime 64-dollar questions.

Some nations, such as Canada and Denmark, hold to the segment method of ownership. That is, the nations facing the Arctic cut it up like a pie. A nation facing the mass would draw a wedge-shaped sector from its frontier to the North Pole. All the area within the wedge would then belong to that nation.

This would leave the United States with only that territory facing Alaska. This nation does not accept the segment division, but rather, looks on the Arctic region in the same manner as it looks on jurisdiction of the high seas.

The Russians, on the other hand, have extended their claims much farther out than the limits set for jurisdiction of the high seas.

At present, there is no international agreement on ownership of Arctic regions.

Any attempt at setting up weather stations on the Arctic ice pack, which is actually a regional barrier between this continent and Asia, would have to take into account the rotation of the pack, as well as the fact that it is continually shifting.

Winds, tides and currents cause the Arctic ice pack to move. At one point, it may be very near the North American side, and a shift would cause it to drift very near to the Siberian side.

The problem of manning the Arctic ice pack has not faced American strategists to date because of the body's reputation for loosening up at times and then becoming tightly packed.

Most weather stations and temporary bases have been established on more permanent masses of ice.

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MEDICINE

Skewers, Weights Help Stove-in Chests Breathe

► PATIENTS WITH badly "stove-in" chests as a result of being crushed by the steering wheel in automobile accidents can be helped to breathe by a skewer and weight technique reported in the *Journal of the American Medical Association* (Oct. 23).

With a local anesthetic to stop pain, the skewers, stainless steel pins nine inches long, are pushed through the chest muscles but superficial to the ribs. The ends of the skewers on each side of the chest are attached to metal fingers, or "spreaders." These are fastened to weights on an overhead traction frame.

The weight and skewer arrangement pulls the soft part of the chest up so that it will move normally in breathing.

Good results with this new technique in three out of five patients are reported by Drs. Theodore R. Hudson, Robert T. McElvenny and Jerome R. Head of Northwestern University Medical School and Wesley Memorial Hospital, Chicago.

Two of the five patients died of other serious accident injuries, but the skewer and weight arrangement had succeeded in helping their breathing until they died.

In "stove-in" chests from steering wheel injuries, the doctors explain, the normal movement of diaphragm and chest is disrupted. The injury-softened chest areas sink in with each indrawn breath instead of expanding, and move outward instead of inward with each breath exhaled. Coughing is impaired and patients cannot get rid of secretions which then flood the lungs.

"A vicious circle is set up as desperately ill patients struggle for increasing amounts of air only to find the situation made worse by their own efforts," the doctors state.

For minor injuries and as first aid, adhesive tape strapping is satisfactory. But it will not help in the more serious chest injuries, which now cause one-fifth to one-fourth of automobile accident deaths and which, the Chicago doctors say, are likely to increase.

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AERONAUTICS

Advise Pilots to Use Life-Saving Turn

➤ "TURN TAIL and run." This is the advice that the University of Illinois is now handing private pilots who tangle with bad weather.

About 1,000 pilots a year lose their lives when trapped in bad weather. Untrained in instrument flying, they go into a "graveyard spin" or a series of to-and-fro oscillations that dash the plane to the ground or rip it apart.

Backed by the Aircraft Owners and Pilots Association Foundation, researchers at the university's Institute of Aviation have worked out a 180-degree turn designed to get the distressed pilot back to the safety of clear skies. Only an inexpensive turn indicator need be added to the plane.

The controls are set so the plane "flies itself" while the pilot watches the turn indicator and the compass. Then, using only the rudder, the pilot turns his plane completely about and flies out of the storm.

Worked out by Prof. Leslie A. Bryan, director of the Institute of Aviation, Jesse W. Stonecipher, chief flight instructor, and Karl Aron, flight instructor, the method is described in the Institute's Aeronautics Bulletin No. 11.

The first thing a pilot taking the course learns is that he cannot fly "blind" without training, Prof. Bryan said. Nineteen of the first 20 to try went into a graveyard spin in less than three minutes. Instructors rescued man and craft, but the experience had made all pilots eager to learn how to keep out of such situations.

Science News Letter, November 6, 1954

PUBLIC HEALTH

DDT Eaten in Every Meal But Amount Won't Harm

➤ WE EAT some DDT in every meal and store it in our body fat but the amounts are too small to cause any damage.

Studies showing this were reported by Dr. Wayland J. Hayes Jr., of the Public Health Service's Communicable Disease Center, Savannah, Ga., at the meeting in Buffalo, N. Y., of the American Public Health Association.

Restaurant meals and meals in an institution have recently been analyzed for DDT content. The most popular breakfast, lunch and supper offered each day by each restaurant were chosen. Extremely expensive and specialty items were avoided. In each instance a complete, balanced meal was analyzed.

"No meal was found, either in the restaurants or in the institution, which failed to contain some DDT, although some individual food items in the meals were regularly free of the compound," Dr. Hayes stated. "Fatty foods, or foods cooked in fat, tended to contain more DDT than other foods."

An experiment now under way with human volunteers, Dr. Hayes said, shows dosages as high as five-tenths of a milligram per kilogram of body weight can be taken daily for several months without producing any adverse effect which the person eating this can detect or which can be discovered by laboratory or physical examination.

This is about 200 times the average total amount the average sized man would get in breakfast plus lunch plus supper in the meals analyzed.

"The greatest recent advances in our knowledge of DDT," Dr. Hayes said, "are those which define the current exposure and the magnitude of tolerable dosages involving this compound which has contributed so significantly to public health and to agriculture. This quantitative information based on human rather than animal exposure should do much to satisfy any reasonable doubts about the safety of DDT."

Science News Letter, November 6, 1954

ENGINEERING

Low Voltage Can Harm Household Machines

➤ DAMAGE TO refrigerator, home freezer and electric motors in other equipment may occur when trouble on the electric utility's system causes voltage to drop to 85% and frequency to fall from 60 to 53 cycles for as long as 45 seconds.

This finding of the Oregon State College was described in Chicago before the American Institute of Electrical Engineers by J. O. Swanson of the Bonneville Power Administration at Vancouver, Wash., and J. P. Jolliffe of the same Administration at Portland, Ore.

The engineers said the Northwest Power Pool plan provides for such emergencies. When lightning or other mishaps afflict the power system to bring on the bad conditions, the electric utility cuts off load to prevent damage to customers' equipment. When the system has been made stable again at proper voltage and frequency, the load is picked up.

Science News Letter, November 6, 1954

VETERINARY MEDICINE

Vitamin-Hormone Drug Checks Distemper in Dogs

➤ DISTEMPER IN dogs can be checked by a drug that combines a massive dose of anti-anemia vitamin B-12 and the anti-arthritis pituitary gland hormone, ACTH.

This good news for dog owners appears in an announcement from the Armour Veterinary Laboratories, Chicago.

No one knows yet why this vitamin-hormone combination works. Studies are now under way to find this out. However, in tests on more than 600 dogs, the drug has stopped distemper in its course, in most cases, both in the acute stage and in the late, usually fatal, spinal cord complications.

The formula, devised by the Armour staff, has been named ACB-12, and is now going on the market to licensed veterinarians.

Science News Letter, November 6, 1954

IN SCIEN

ENGINEERING

For Cooler Rooms, Use Glass Blocks

➤ ROOMS RECEIVING daylight through glass bricks are cooler than those with flat glass windows, provided the rooms are unventilated, tests at the Texas Engineering Experiment Station, College Station, Texas, have shown.

If the room is adequately ventilated, temperature differences are too small to be of practical importance.

The work was conducted by Dr. E. G. Smith in a full-scale building used in other architectural experiments. He divided the building into two equal rooms by means of a partition so that tests of the two fenestrations could be conducted under exactly similar conditions, especially with regard to exposure to the sun.

His findings revealed that the flat glass windows transmit and trap within the room more solar radiation than do glass block windows.

Science News Letter, November 6, 1954

MEDICINE

More Women Are Now Getting Ulcers

➤ STOMACH ULCERS, once considered almost exclusively an affliction of men, are now becoming more common in women.

Mama's ulcers, however, are more likely to be overlooked because she does not complain about them as much as papa does.

So Dr. Joseph Shaiken of Marquette University Medical School, Milwaukee, reported at the meeting of the National Gastroenterological Association in Washington.

"Ulcers in women are more likely to occur during the menopause, or change of life," Dr. Shaiken said. "Pregnancy invariably has a beneficial effect on ulcer patients of an earlier age."

Repeated scarring of the stomach wall by ulcers at the junction of the stomach with the small intestine often results in inability of the stomach to empty, Dr. William T. Gibb of George Washington University School of Medicine, Washington, told the gathering of stomach specialists.

The inability of the stomach to empty is not due to actual obstruction, as might seem to be the case. Instead, Dr. Gibb explained, it is due to exhaustion of the muscle fibers in the wall of the stomach.

The stomach in such cases becomes a "flabby bag," he said. Unlike the muscle of an overworked heart, the stomach muscle does not enlarge.

Simply washing out the stomach often brings marked relief in such cases, Dr. Gibb reported.

Science News Letter, November 6, 1954

CE FIELDS

BIOCHEMISTRY

Plant Growth Stopper Studied as Cancer Aid

➤ A CHEMICAL that makes plants stop growing without killing or harming them is now being studied to see whether it has any possible cancer-checking effects. The study by Dr. Aubrey W. Naylor of Duke University, Durham, N. C., is supported by the American Cancer Society.

Maleic hydrazide is the chemical, and it has been tested only in one or two cancer patients so far as is known. In these experiments, conducted by scientists in San Francisco, it did not interfere with growth of the tumors.

Further studies are now being undertaken in hope that the mechanism of action, if and when known, may suggest ways of arresting animal and human cancers.

Maleic hydrazide affects only the terminal growing parts of plants, that is, the tips of roots and stems and the buds. It does this by preventing the division of the very cells on which the plant depends for increased stature. The nuclei of these cells of treated plants swell and the cytoplasm which surrounds them becomes more transparent. This is a characteristic of cell injury without repair.

The older and well-formed leaves of plants treated with maleic hydrazide continue to live, but the growth of new, half-formed leaves ceases completely. The chemistry of the plant, its metabolism, slows down almost to a standstill.

Science News Letter, November 6, 1954

SURGERY

Baby Given New Nose So Parents Will Accept Him

➤ A FOUR-MONTHS-OLD baby boy was saved from being completely rejected by his parents when a plastic surgeon made him a new nose.

The case was reported by the surgeon, Dr. Michael L. Lewin of St. Joseph's Hospital, Paterson, N. J., at the meeting of the American Society of Plastic and Reconstructive Surgery in Hollywood, Fla.

Half of the baby's upper lip and two-thirds of his nose, including the septum which divides the two nasal cavities, were destroyed by a meningococcal infection when the baby was two months old. His life was saved by antibiotics and cortisone. His lip was repaired at the age of four months.

However, when the customary delay of three or four years was suggested before reconstructing the nose, his parents refused to take him home from the hospital.

Reason for the suggested delay in the nose operation was that a nose reconstructed in infancy would need to be operated once or twice again to keep pace with the growth of the rest of the child's face.

The 21-year-old ex-serviceman father and 18-year-old non-English-speaking Italian girl mother could not accept the deformed child. The hospital could not keep him indefinitely and there was no institution for him.

Attempts to mask the deformity with a false nose of acrylic and latex failed because the baby pulled or rubbed it off.

So, starting when the baby was five months old, Dr. Lewin in a series of seven operations built him a new, giant nose which his now two-year-old baby face is beginning to grow up to. His parents accepted him completely, once he had a nose, and are now devoted and attentive, Dr. Lewin reported.

Science News Letter, November 6, 1954

TECHNOLOGY

Mobile Powerhouse for Disaster Area Aid

➤ MOBILE AUTOMATIC powerhouses that could aid disaster areas such as those left in the wake of hurricane Hazel have been developed by General Motors.

The diesel-powered electric generators can be housed in either a truck's trailer or in a railroad car. They can be dispatched quickly to the disaster scene and operated as emergency sources of electricity to bring light and power to hospitals, refugee centers and civil defense radio stations.

N. C. Dezendorf, GM vice-president, said the mobile powerhouses can be put into immediate mass production "side by side" with diesel locomotives now being built at the La Grange, Ill., plant.

Designed primarily for emergency use by electric utilities, the mobile powerhouses also could provide large blocks of power for military maintenance stations close to the front line, he said.

The machines are completely automatic. They can be started or stopped by radio, by a dialed telephone number or by automatic electric relays. They can be controlled by an operator hundreds of miles away.

When the "go" signal is given, the machine starts automatically and accelerates to its full speed of 720 revolutions a minute in about five seconds. The generator is automatically synchronized with the line, if it is acting as a helper generator, and is fully loaded within 45 seconds of starting.

Electric utilities may save "hundreds of millions of dollars" by using the units to meet seasonal or peak demands for electricity, Mr. Dezendorf said. By spotting the units around the fringes of a utility's system, engineers may avoid the necessity of building new tie-lines or power plants.

The railroad version of the mobile powerhouse is made in capacities of 750 and 1,000 kilowatts. The highway version is made in 350- and 500-kilowatt sizes. The generators operate at 4,160 or 2,400 volts.

Science News Letter, November 6, 1954

ARCHAEOLOGY

Prehistoric "Las Vegas" Yields Gambling Setup

➤ EQUIPMENT FOR dice, skill-ball and other gambling games has been discovered in a prehistoric "Las Vegas" by University of California scientists under the direction of Dr. Clement Meighan.

Analysis of relics recovered from the site of a 1,000-year-old Indian village in southwestern Utah revealed many bone gaming pices. The pieces were marked in different ways and apparently were intended as dice for gambling.

A number of stone balls about the size of golf balls were also found. These suggested a prehistoric version of "skill-ball."

The "sports-minded" community, occupied some time during the 10th century, was a sizable one of several dozen buildings of wood and adobe. In and around the houses were found remains of several thousand objects of Indian manufacture. These included pottery vessels, arrow points, grinding stones and other domestic instruments.

Two Indian tombs were found. Both were adult graves carefully prepared by covering the body with bark and sticks, and sealed with a foot of wet clay. One grave contained skeletons of three rodents and six birds. The animals were thought to have been placed in the grave as food for the spirit.

Science News Letter, November 6, 1954

HORTICULTURE

New Strawberry Variety Resistant to Red Stele

➤ STELEMASTER, THE first commercial strawberry variety resistant to all races of a strawberry ill called the red stele, will be available in limited numbers for 1955 planting.

Particularly injurious in the eastern United States, red stele is a soil-inhabiting fungus for which no practical way of eradication is known.

Red stele attacks the roots, turning the steles or central part of the plant roots red. The roots, in turn, die. Plants infected by the disease either die or become badly stunted and produce only a few small berries.

Other varieties of strawberries have been proven resistant to one or several races of the disease, but Stelemaster is the first that has proven resistant to all known kinds of the disease.

The new variety grows best in moist soil, which is also the best for the fungus. It is an early season strawberry, described as medium-sized, smooth and with a light red, juicy flesh.

The berries, however, are not satisfactory for freezing.

Stelemaster was developed by the U.S. Department of Agriculture and the Maryland Agricultural Experiment Station.

Science News Letter, November 6, 1954

GENERAL SCIENCE

Security System Harmful

Dr. Vannevar Bush reveals he believes there are two "serious weaknesses" impeding research and development in the defense program of the United States.

Following are excerpts from testimony by Dr. Vannevar Bush, president of the Carnegie Institution of Washington, to a subcommittee of the House Committee on Government Operations. Although the hearings were held in June, they were made public only last month.

▶ "LET ME say first of all that the development of weapons is very closely interlinked with their use; and it is impossible to separate the discussion of their development completely from the way in which they are used in practice.

"I think there are two serious weaknesses today that impede our program of research and development.

"First, the security clearance system as now practiced is, in my opinion, doing great damage to the relations between science and Government, and particularly to the relations between scientists and weapons development.

"Second, it seems to me that we have lost our effectiveness in getting new weapons tested, tried out, produced on an experimental basis, and finally introduced in use. . . ."

Dr. Bush then explained his reasons for believing that there was room for much improvement in the use of the latest scientific advances by the Joint Chiefs of Staff in their planning operations.

Security System Doing Harm

"Now, let me turn to the other weakness for a moment, and that is the security system.

"I don't need to bore you, certainly, with a detailed recital. I feel that the way in which our security system is working at the present time is driving a wedge between the military and the scientific people of the country, and is doing great harm.

"During the war there was developed a partnership between military men and scientific men. It was not brought about automatically; it is not a thing that occurs readily.

"These men come from different backgrounds, and it is hard for each group to understand the other; but nevertheless, by the end of the war an excellent situation had developed in which there was mutual respect between the two groups and they operated together well.

"It must be remembered that one cannot plan modern war merely from the military standpoint or merely from the scientific standpoint. It takes both types of thinking to produce success.

"That partnership, which was a healthy one at the end of the war, is, in my opinion, now almost destroyed, and one of the primary reasons is the security system.

"Now, I will not go into the Oppenheimer affair. I have written on that subject, and I think I should avoid entirely any question of the operations of the central committee.

"And I will not go into the Monmouth matter. But let me bring to your attention just 1 or 2 small incidents that will show the type of thing that is occurring all about us and that is so trying. . . .

"Now, these instances seem trivial, but they are not. The scientists, generally, that served well, loyally, and vigorously now find that they are being queried, and people are going about asking questions about them.

Air of Suspicion

"The whole air of suspicion is just not such as to produce good collaboration, the kind of really wholehearted collaboration between military men and the scientific community that we very much need to have for the problems that are ahead of us.

"For we are not at the end of the possible development of weapons. Not all the problems have, by any means, been solved. We hear a great deal about A-bombs and H-bombs; we do not hear as much about biological warfare, but I can assure you gentlemen that I am as deeply concerned about that as a possibility as I am about fission bombs and fusion bombs.

"I can also say to you that the morale of the scientists today as I meet them is low, so low that while they will not refuse to serve, they will serve without enthusiasm and without fruitful inspiration. . . .

". . . We also need to clear up the security matter and get back on firm ground. It is merely a question of how well the scientist group will work.

"There will be no refusal on the part of scientific men to respond when called on. You won't find any strikes, or any such thing. But scientists today are discouraged and downhearted and feel that they are being pushed out, and they are. . . .

"The morale is very low indeed, and it is quite natural that it should be. Let me give you an example. I could give you dozens of examples.

"I met a week ago a man who was a member of the scientific committee that is advisory to the Security Council, and he said to me, 'Well, we have practically stopped working. It is quite impossible to accomplish anything in this atmosphere.'

"Now, that is the sort of reaction I would get out of 3 out of 4 scientists today. They go on working, but they feel that they are not welcome, that they are regarded with suspicion, that some of the men who led them during the war are now being questioned and their security and loyalty are in doubt.

"They are like an army without trust in their top leadership or in the political leadership of the country.

"They feel they are part of a group that at the present time is not considered necessary, that they are looked on askance by their neighbors, and they have no enthusiasm, they have no heart for their work.

"I think the basic problem is far deeper than any one move, but I feel that the President's Executive order and the way it has been implemented have been very unfortunate and have increased the seriousness of the situation.

"The basic fact is that this country has been going through a wave of hysteria. When people are afraid they do strange things. One of their immediate responses is a tendency to abandon their liberties, they tend to ride roughshod over some of their own fundamental rights.

"We are afraid in this country, and quite rightly so; we should be afraid in the proper sense in a day of H-bombs; we should be afraid, also, of a situation in which we know that Communists have penetrated our defenses. We have traitors in our midst, and there is reason for being afraid of them. But out fear in this country has taken the form of a hysteria in which

"That's No Eagle"

—Herblock in The Washington Post and Times Herald

we have gone to extremes, and we have disregarded rights.

"We have put all our emphasis on preventing some of our secrets from leaking and no emphasis to speak of upon getting some secrets that might be worth leaking and into this situation came the Executive order, and I think it was poorly drawn, has been poorly interpreted, and has made the situation much worse than it was before."

Science News Letter, November 6, 1954

INVENTION

Color TV Tube Given Patent

▶ DR. ERNEST O. Lawrence, University of California Nobel Prize physicist, has received patent No. 2,692,532 for his color TV tube, which is being shown in an exhibit dramatizing the growth of electronics.

Science News Letter, November 6, 1954

PUBLIC HEALTH

Pinpoint Smog Sources

▶ WITHOUT SHUTTING down oil refineries, other industries and without reducing auto use, high-speed computing machines can pinpoint the sources of smog, research at the National Bureau of Standards has shown.

Dr. Francois N. Frenkiel, a physicist at Johns Hopkins University's Applied Physics Laboratory, Silver Spring, Md., has reported that Standards' electronic computer, SEAC, had been put to work on the Los Angeles smog problem. (See SNL, Oct. 30, p. 279.)

Using actual wind velocity measurements, the machine traced the movement of smoke puffed into the air. Mrs. Luis Marden, a Standards mathematician, supervised the pilot study of the smog problem on the machine.

Although the machine's calculations were made for a past situation, an electronic "brain" could also be used to figure conditions or to predict smog prevalence a few hours in the future.

Shutting down only a few sources for a short time might be sufficient to alleviate the smog hazard.

Refineries, Dr. Frenkiel pointed out, contribute to the smog in a "non-negligible proportion," but so also do cars, filling stations and incinerators. Removing one or more of these sources would "clean the air," Dr. Frenkiel said, but wrong conclusions as to their responsibility in causing the smog might then be reached.

Although the October Los Angeles smog did not threaten to become as dangerous as the London smog of December, 1952, nevertheless it was an unknown health hazard. Present regulations for dealing with the smog situation may no longer be "appropriate," Dr. Frenkiel said.

Although he recommended long-range basic research on the problem, he urged that present knowledge be put to use right away.

"Los Angeles county, which largely owes its livelihood and its high living standards to the existence of many sources of pollution, can find how to live with the sources which are necessary to its comfort without letting them become a health hazard," Dr. Frenkiel predicted.

Science News Letter, November 6, 1954

SURGERY

Post-Cancer "Milk-Arm" Relieved by Operation

▶ OPERATIONS WHICH relieve the pain and swelling of "milk-arm" and "milk-leg" were announced by Drs. Lyndon A. Peer, Manouchehr Shahgholi, John C. Walker Jr. and Alvin Mancusi-Ungaro, all of St. Barnabas Hospital, Newark, N. J., at the meeting of the American Society of Plastic and Reconstructive Surgery in Hollywood, Fla.

"Milk-arm" is a swelling of the arm which affects a small percentage of women who have undergone a radical breast operation for cancer. In this radical breast operation, removal of lymph glands of the armpits sometimes blocks drainage of the lymphatics of the arm and forearm. This results in the severe and progressive swelling known medically as lymphedema.

In the operation reported at this meeting, the thickened fibrous tissue surrounding the muscles is removed to allow blocked lymph glands to drain into the body circulation.

Improvement in five cases of "milk-arm" and two cases of "milk-leg" were reported by the Newark group.

"Milk-leg" is a swollen, painful condition of the leg due to the same lymph blockage that produces "milk-arm," although "milk-leg" develops when there has been no cancer operation. "Milk-leg" often starts during a young girl's adolescence.

One of the patients with "milk-leg" who got an "excellent" result from the operation is a 15-year-old girl. The other is an older patient who had the condition in both legs for 15 years.

Science News Letter, November 6, 1954

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE DOCTORS MAYO — Helen Clapesattle — *University of Minnesota Press*, 2d ed. condensed, 426 p., illus., $4.75. This new edition brings back into print after three years this popular biography of the famous doctors.

FISHER/TAG MANUAL FOR INSPECTORS OF PETROLEUM — *Fisher Scientific*, 28th ed., 218 p., illus., $1.75. Revised and rewritten by the petroleum specialists of the Fisher Research and Development Laboratories, with the advice and cooperation of the ASTM.

FOOD PRODUCTS AND PROCESSES: Government-Owned Inventions Available for License — Archie M. Palmer, Chairman — *Office of Technical Services*, Patent Abstract Series, No. 3, 21 p., paper, $1.00. Containing 265 brief descriptions of government-owned inventions relevant to the food industry.

FREAKS AND MARVELS OF INSECT LIFE—Harold Bastin — *Wyn*, 248 p., illus., $3.75. Describing the odd characteristics peculiar to these six-legged creatures.

GENERAL EDUCATION BOARD ANNUAL REPORT, 1953 — Dean Rusk, president — *General Education Board*, 57 p., paper, free upon request direct to publisher, 49 West 49th St., New York. The year 1953 marked the end of the direct scholarship and fellowship programs of the Board, because of depletion of funds.

GEOLOGY OF PETROLEUM — A. I. Levorsen — *Freeman*, 703 p., illus., $8.00. For students but also petroleum geologists who are actively exploring for oil and gas pools.

THE GUEST WEATHERCASTER — Raymond M. Sager — *Guest Products Corporation*, 25 p., illus., paper, $5.00. This little book has a multiple dial on the cover which you can set for wind direction and velocity, barometer reading and present weather. It is then possible to read off a weather forecast.

GUINEA PIGS—L. B. Fink—*All-Pets*, 24 p., illus., paper, 35 cents. For those who wish to raise these animals as a hobby or for scientific purposes.

THE HIDDEN LIFE OF FLOWERS—Photographs by R. H. Noailles, Text by J. M. Guilcher—*Philosophical Library*, 93 p., illus., $4.75. Extraordinarily beautiful photographs, and text, on the birth, life and death of the living plant.

INTRODUCING ANIMALS — William and Helena Bullough—*Crowell*, 56 p., illus., $2.50. For children, introducing animals without backbones, from the simple and microscopic ameba to the giant squid.

MAMMALS OF CALIFORNIA AND ITS COASTAL WATERS—Lloyd Glenn Ingles—*Stanford University Press*, 396 p., illus., $6.00. A new and revised edition of a work originally published in 1947 under the title, "Mammals of California."

MARGINS OF THE SEA — Maurice Burton — *Harper*, 212 p., illus., $3.00. Giving a new look at the creatures that survive the difficulties of life between the high and low tidemarks of the sea.

MEDICAL TECHNOLOGISTS AND LABORATORY TECHNICIANS—*Govt. Printing Office*, U. S. Department of Labor Employment Opportunities for Women Medical Series Bulletin No. 203-4 (1954) 54 p., illus., paper, 25 cents.

THE MICROPHYSICAL WORLD—William Wilson—*Philosophical Library*, 216 p., illus., $3.75. Giving present-day knowledge about atoms and molecules, their structure and behavior, and tracing the development of the atomic theory from the time of John Dalton to the present.

MITOSIS AND MEIOSIS IN LUZULA CAMPESTRIS DC.—Spencer W. Brown—*University of California Press*, University of California Publications in Botany, Volume 27, No. 4, 48 p., illus., paper, 75 cents. Ordinarily, mitosis depends upon a discrete part of the chromosome, the centromere. Presented here is a description of how mitosis takes places in a genus of plants lacking this part.

REPORT OF THE NATIONAL CONFERENCE ON JUVENILE DELINQUENCY: Held June 28-30, 1954, in Washington, D. C.—Conducted with the assistance of the Children's Bureau and the Special Juvenile Delinquency Project — *Govt. Printing Office*, Children's Bureau, 77 p., paper, 25 cents. The principal purposes of the conference were to review accomplishments to date, to discuss and define the most urgent needs at present and to formulate the next steps.

SAVING YOUR MARRIAGE — Evelyn and Sylvanus Duvall—*Public Affairs Committee*, Public Affairs Pamphlet no. 213, 28 p., illus., paper, 25 cents. How to avoid many marriage troubles and how to get help if you need it.

SCIENCE NEWS 33 — A. W. Haslett, Ed. — *Penguin*, 127 p., illus., paper, 50 cents. Describing recent research in various fields of science.

TREE FROG—Paul McCutcheon Sears—*Holiday House*, 46 p., illus., $2.00. This attractive book for children was checked for accuracy by Prof. Arthur N. Bragg, University of Oklahoma zoologist.

WINGS: Insects, Birds, Men—Blanche Stillson—*Bobbs-Merrill*, 299 p., illus., $3.50. Recounting the history of flight, not for 50 years, but since the first insect took off at least 300,000,000 years ago up until the days of the Wright brothers at the beginning of this century.

YOUR BREAKFAST AND THE PEOPLE WHO MAKE IT—Benjamin C. Gruenberg and Leone Adelson—*Doubleday*, 64 p., illus., $2.00. Telling children of all the things that must happen before the oatmeal gets into your bowl and the bread is popped up in your toaster, to say nothing of the orange juice, butter and eggs.

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What General Electric people are doing . . .

QUIET TUBE

The U.S. Navy Bureau of Ships is interested in anything which would extend the range of its early-warning radar stations. Since a target is identified by distinguishing a pip on a radar screen from smaller, noise-generated irregularities, any reduction in noise would make the pip more discernible.

Our Research Laboratory has been working under Navy sponsorship for the past few years to design a strong, low-noise tube for microwave applications. Such a tube has now been developed, in collaboration with our Tube Department. In this tube noise is reduced by keeping the electrodes extremely close together, thus reducing the transit time the electrons require to travel from cathode to grid. The shorter the transit time, the smaller the noise factor.

The new tube, designated GL-6299, is not a single-frequency device, although it was designed for use at microwave frequencies. In fact, it exhibits improved performance throughout the radio and audio-frequency ranges. For usefulness over a large frequency range, it has been made adaptable for use in circuits of the cavity, parallel-line, or lumped-constant type. Despite its small size, it operates at currents and voltages comparable to those of conventional receiving tubes. It is being marketed by our Tube Department in Schenectady.

MAGNETIC SIGNATURES

Determining the magnetic characteristics of a metal can be a long and tedious business. The usual method requires long calculation, using data gathered from sensitive ballistic galvanometers. But that's been changed.

Our General Engineering Laboratory in Schenectady has developed a device called a D-c Recording Hysteresigraph, which eliminates the hours of laborious measurement and calculation. It traces the magnetic "signature" of a metal directly onto a scaled chart in a matter of minutes. It is able to do this with the use of two fluxmeters, which integrate the flux voltage continuously.

The new instrument is expected to be a valuable quality-control device for manufacturers of special steel. Laboratories can also make use of it in obtaining accurate data on commercially-available materials and in the development of new alloys.

LIFE PREDICTER

The conventional way of finding out how long a fluorescent lamp will burn before it fails is to let it burn until it fails. But now the engineers of our Lamp Division at Nela Park, Cleveland, can make a pretty good prediction beforehand.

Other things being equal, they find, the life of a fluorescent lamp is proportional to the amount of emission coating on the cathode. By weighing this emission coating, the life of the lamp can be estimated.

Our engineers at Nela Park have developed a rapid method of testing such lamps for the quantity of chemical on their cathodes without breaking open or lighting the tubes. The lamp is compared in an electronic circuit with one having an uncoated cathode. When current is applied, the coated cathode is slower to increase in temperature. The difference is roughly proportional to the weight of the emission coating, and it can be read on a meter.

RADIOACTIVE SILICONES

Our Silicone Products Department in Waterford, New York, recently made joint announcement with Abbott Laboratories of North Chicago, Illinois, of an Abbott Laboratories project making radioactive silicones available for medicine and industry. Such silicones may prove to be a valuable research tool in certain areas. Radioactive silicone fluids, for example, are made readily measurable in minute amounts by the incorporation of Carbon-14, and they are expected to offer a clearer insight into the behavior of silicones in the human body than could previously be obtained.

The new fluids have been designed for laboratory and clinical test work. They will not be a part of finished medicinals sold to the consumer. In conformity with Atomic Energy Commission practice, such initial studies must be conducted on animals only.

FILM FIXER

What camera fan hasn't spent hours in a darkroom trying to minimize the harmful effects of scratches, dust, or fingerprints on his favorite 35-mm negative? Thanks to Dr. C. Guy Suits, vice president and director of our Research Laboratory, all three of these defects can now be corrected.

Dr. Suits, one of whose hobbies is photography, found that most of the troublesome damage from scratches occurred in the film base or in the gelatine overcoat, rather than in the silver image between. He reasoned that a liquid with the right properties might fill the "valleys" formed by scratches and eliminate the valley side surfaces that scatter light. Although glycerine has been used for this purpose, it is very viscous and forms bubbles.

He finally found the solution in a silicone oil, which has been named Refractasil. Not only did it solve the scratch problem, it also turned out to be a highly satisfactory cleaner, removing fingerprints like magic. And with a special circulating container designed by Dr. Suits, it served to remove dust particles, as well.

Equipment using the Suits technique may soon be marketed by another manufacturer. Refractasil, the silicone oil, is already in production in our Silicone Products Department at Waterford, New York.

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NATURE RAMBLINGS

Annual Rings

▶ TREES ARE undoubtedly the classic example for having annual growth rings, but they are by no means the only example.

Fish, clams, scallops, land turtles, bighorn sheep and old-world goats all possess annual growth rings, which enable man to determine their age.

Fortunately, unlike trees, it is not necessary to cut the animals in two to find the growth rings. The rings are all external and evident.

Fish biologists have counted the growth rings on a single fish scale as an age determinant for many years. Red salmon, for instance, gives its traveling habits away with its growth rings. Biologists are able to tell from the rings on a salmon scale how long the salmon has been in fresh water, how long it has been roaming the sea, and how long it has been back in fresh water on its voyage home.

Using the fish scale as an actual age scale has helped the fish experts to check the number of fish returning each year to their fresh water spawning beds as opposed to the number of young salmon released four or five years earlier. It is nature's tagging system.

Growth rings on a scale appear in shad, mackerel, herring, sardines and trout. One can even determine the age of his pet goldfish.

The shell of a Pacific razor-clam gives its age and activity away. Light circles indicate the period of the year when the clam was inactive, mostly during the winter months, whereas heavy markings indicate the very active summer feeding months.

Since the age of the clam determines its size, conservationists have been able to check clam populations and regulate the catches by taking the annual average age of the clams.

Growth rings on off-shore scallops appear as fine concentric bands on the shell and possibly the fascination for sea-shell collectors is caused by nothing more than a scallop's old age.

Several land turtles, particularly the box-turtle, have tell-tale growth rings on each scale, both underneath and topside. Often, these markings are worn away on the underside as the turtle moves slowly overland. Very old turtles will also be minus visible rings.

The horns of the big-horn mountain sheep and the old-world goats are simply circles of growth rings. With the mountain sheep these are often obliterated when they bang heads with each other during the mating season.

The popular belief that rattles of a rattlesnake are an age indicator is not accurate, nor can rattles be considered growth rings. A rattlesnake is born with a little button at its tail. Soon after birth, the snake sheds its skin and adds a rattle. With each skin shedding, a rattle is added. But a young snake may shed its skin ten or more times in the first three years.

Then, too, when a snake has ten or more rattles, additional rattles tend to break off. So, it is quite impossible to tell the age of a rattlesnake from the number of its rattles.

Man, fortunately or unfortunately as the case may be, has no similar annual growth rings, only wrinkles and birthdays.

Science News Letter, November 6, 1954

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RADIO

Radios May Fail in Jets Because of Engine Scream

▶ RADIO AND radar equipment may fail in jet planes because of the loud scream of the engine.

Engineers F. Mintz and M. B. Levine of the Armour Research Foundation told the American Institute of Electrical Engineers in Chicago that jet noise is growing more important as a cause of electronic and some mechanical failures.

Tests in a special sound chamber revealed that small electronic tubes and relays failed or did not work properly when subjected to noise blasts simulating those of jet and rocket engines and guided missiles.

The sound level may approach 150 decibels 10 feet from the tail pipe of a jet plane when the engine is operating at full thrust, the engineers reported. Noise level in the equipment bay approaches 140 decibels.

Science News Letter, November 6, 1954

Questions

ENGINEERING—How can low voltages and frequencies affect household electric equipment? p. 296.

□ □ □

GENERAL SCIENCE—Why are above average people a valuable resource? p. 293.

□ □ □

GEOGRAPHY—What causes the Arctic ice pack to move? p. 295.

□ □ □

NUTRITION—What disease follows low vitamin C intake? p. 293.

□ □ □

PUBLIC HEALTH—How can smog sources be pinpointed? p. 299.

□ □ □

TECHNOLOGY—What are possible uses for a mobile powerhouse? p. 297.

□ □ □

Photographs: Cover, F. P. Reding and Alexander Brown; p. 291, Fremont Davis; p. 293, BiB Corporation; p. 295, U. S. Air Force; p. 304, Seal-Dri Sportswear Co.

PHYSICS

Study Polyethylene by Electron Micrograph

See Front Cover

▶ SHOWN ON the cover of this week's SCIENCE NEWS LETTER is an electron microscope photograph of the aggregated crystal structure in a thin cast film of polyethylene, enlarged approximately 30,000 times.

It was taken by Drs. F. P. Reding and Alexander Brown of Carbide and Carbon Chemical Company's research and development department, South Charleston, W. Va.

Science News Letter, November 6, 1954

Fireblight, a bacterial disease that has killed millions of fruit trees over the past 100 years, has been stopped for the first time with minute amounts of antibiotic drugs in a water spray.

MATH IS FUN
By Joseph Degrazia, Ph.D.
Here is a treasury of brain-teasers. You need not be a mathematical genius to solve these problems and puzzles. What you need is to know how to THINK LOGICALLY—how to REASON. This is practically a "course" in applied logic and reasoning—besides being an immense amount of fun that will keep you absorbed for many hours. You will find not only that MATH IS FUN, but also that learning math can be fun!
CONTENTS: Trifles—On the Borderline of Mathematics—Faded Documents—Cryptograms—How Old Are Mary and Ann?—Wolf, Goat and Cabbage—and Other Odd Coincidences—Clock Puzzles—Trouble Resulting from the Last Will and Testament—Speed Puzzles—Railroad Shunting Problems—Agricultural Problems—Shopping Puzzles—Whimsical Numbers—Playing with Squares—Miscellaneous Problems—Problems of Arrangement—Problems and Games—Solutions. Many delightful and helpful illustrations
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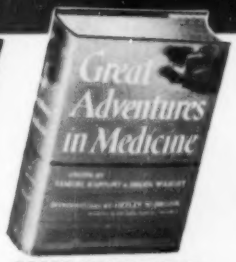

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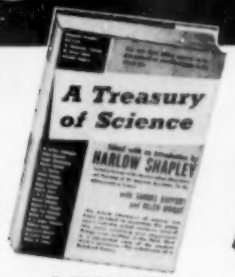
Containing more than 70 carefully chosen selections, this large book covers the most interesting, exciting and important developments in the field of medicine from the crude but often courageous research of early times to the miraculous achievements of this era. It is virtually a history of the progress of medical science. Retail price, $5.00.



A TREASURY OF SCIENCE

Edited by HARLOW SHAPLEY

A massive anthology of man's entire universe of knowledge. Includes writings of Galileo, Franklin, Pasteur, Curie, Einstein, Darwin, Beebe, Ditmars and many others. This newly revised and enlarged 3rd edition brings you much new material on atomic research, medicine, etc. Retail price, $5.95.

THE CHALLENGE OF MAN'S FUTURE

by HARRISON BROWN

One of America's foremost geo-chemists produced this sobering analysis of the hazards that face mankind in the years ahead. Neither an alarmist nor a buoyant optimist, Brown examines the trends and facts from a scientist's unbiased viewpoint. "This objective work has high value," wrote Albert Einstein. Retail price $3.75.

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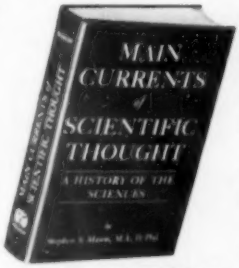
by DOUGLAS McKEE

A scholarly yet highly readable account of the life and work of "the father of modern chemistry" — the 18th century genius who first broke down air and water into their basic components and compiled the first table of chemical elements. McKee's book is a perceptive recreation of the great scientist's life, written with compassion and understanding. Retail price, $6.00.

THE WORLD OF NATURAL HISTORY

by JOHN RICHARD SAUNDERS

Reading this book is like being taken on a personally conducted tour of that fabulous treasure house, the American Museum of Natural History, in New York City. Along with lucid descriptions and many illustrations of the famous exhibits and Hayden Planetarium, the author gives you the history of man's discovery of the natural sciences and the growth of the Museum over the years. Retail price, $5.00



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• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 751. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

TRIPOD STAND holds a laundry basket, or even a bushel basket, at the proper height while the housewife irons or fishes clothes out of rinse water. The clothes basket is spring-clipped to the three rectangular steel frames that serve as legs. The stand weighs only 14 ounces.

Science News Letter, November 6, 1954

HAIR-CUTTING AIDS for amateurs and professionals attach to any make of clipper quickly. They are said to eliminate the hazard of gouging and step-cutting which are most feared by amateurs. They also speed up specialized hair cut styles such as butch, burr, crew and GI cuts. They are made from a durable plastic material and have plated spring clip fasteners.

Science News Letter, November 6, 1954

WIDE SCREEN for 16 mm movie projection has been developed and is contained in a semi-portable aluminum frame. When not in use the screen, which hooks to its frame, rolls on to a special tube that fits with the collapsed frame into a convenient shipping or storage container.

Science News Letter, November 6, 1954

FLOATING JACKET and pants help keep a sportsman warm and afloat in frigid waters should his boat capsize. When the garments, shown in the photograph, are worn afield, the lightweight jacket can be

reversed to show its red poplin side instead of the green nylon side designed for duck hunting. Pants and jacket can be bought separately.

Science News Letter, November 6, 1954

SAW ATTACHMENT for one-quarter-inch electric hand drills will not overload the tool while sawing through a two-by-four with its six-inch circular blade. A trimmer attachment permits the user to shape hedges more easily.

Science News Letter, November 6, 1954

SUSPENDERS NOW are being made "extra-wide" with built-in pockets for carrying combs and nail files. Their faille weave is strengthened with rayon, and the pocket flaps are made of kid leather.

Science News Letter, November 6, 1954

COLOR FILTER permits amateur photographer to take better color pictures in almost any kind of weather. By giving him control of the "color balance" of the picture, the adjustable filter also extends the daylight hours through which he can make better color shots.

COLOR CONTROL meter, made by the same company, is designed for use with the new filter and for standard color correction filters. The meter measures the balance of red and blue in natural light and indicates the proper filter for the picture. The meter shows the photographer how to exaggerate colors for special effects, or how to correct them for better results.

Science News Letter, November 6, 1954

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11-6-4

Do You Know?

One pound of *coal* will heat a one-family home during the winter for 22 minutes.

Cobalt-60 successfully sterilizes seafood wrapped in polyethylene and tin foil without leaving it radioactive.

Diamond prospecting is the most recent field to which the use of atomic instruments has been applied.

Forecasting where or when a *hurricane* will form is, in general, like predicting which of 10 people will first develop cancer.

A new *X-ray microscope* is able to magnify details of internal structures of metals and small objects as much as 1,500 diameters.

A "monolithic ceramic" *insulator* used in spark plugs in World War II enabled fighters and bombers to reach altitudes never before attained.

An *artificial hand* with three "working" fingers permits amputees to grip with greater force than average persons can with their own hands.

South Africa, Southern Rhodesia and Bechuanaland are cooperating to rout the menace of *rogue elephant* herds that have terrorized farmers, tribesmen and cattle, and destroyed homes.